Claims

1. A fuel injector (1) for a common rail injection system for injecting fuel into a combustion chamber (43) of an internal combustion engine, having an injector body (2) and a nozzle body (3), in which nozzle body an injection valve member (21) embodied in multiple parts is received, and having a piezoelectric actuator (6), connected downstream of which is a hydraulic booster assembly (9), control chambers (19, 20) being associated with the multi-part injection valve member (21) for actuating it, characterized in that the hydraulic booster assembly (9) actuated by the piezoelectric actuator (6) has booster chambers (13, 17), which are each directly connected hydraulically with control chambers (19, 20) that actuate the needle parts (22, 23) of the injection valve member (21).

2. The fuel injector as recited in claim 1, characterized in that the first booster chamber (13) communicates with the second control chamber (20) for the outer needle part (22) via a conduit (16), and the second booster chamber (17) communicates with the first control chamber (19) for the inner needle part (23).

3. The fuel injector as recited in claim 1, characterized in that between the needle parts (22, 23), guided one inside the other, of the multi-part injection valve member, a pressure chamber (29) is embodied, which can be filled from a nozzle chamber (8) surrounding the multi-part injection valve member (21).

4. The fuel injector as recited in claim 1, characterized in that a first and a second pressure step (25, 26), acting in the opening direction, are embodied on the outer needle part (22) of the multi-part injection valve member (21).

5. The fuel injector as recited in claims 3 and 4, characterized in that the second pressure step (26) is embodied in the pressure chamber (29).

6. The fuel injector as recited in claim 1, characterized in that a pressure step (28) is embodied on the inner needle part (23), on the end toward the combustion chamber, and its hydraulic area operative in the opening direction of the inner needle part (23) is less than the hydraulically operative areas of the first and second pressure steps (25, 26) of the outer needle part (23).

7. The fuel injector as recited in claim 1, characterized in that the hydraulically operative areas, in the opening direction, of the pressure steps (25, 26) of the outer needle part (22) exceed the hydraulically operative area (28) $\pi(d_2^2 - d_1^2)/4$ on the end toward the combustion chamber of the inner needle part (23).

8. The fuel injector as recited in claim 1, characterized in that a first seat (31) is formed on the outer needle part (22) and a second seat (33) is formed on the inner needle part (23), which seats cooperate with a wall of the nozzle body (3).

9. The fuel injector as recited in claim 1, characterized in that the piezoelectric actuator (6) is integrated with the fuel inlet (5).

10. The fuel injector as recited in claim 1, characterized in that in the direction of the combustion chamber (43), first injection openings (35) that can be opened or closed by the first seat (31) and second injection openings (36) that can be opened or closed by the second seat (33) are embodied on the nozzle body (3).